

Appl. No. 09/844,175
Response to Office Action mailed 9/28/2005

In the Claims

Claims 1-30 are canceled.

31. [Previously Presented] A removable electrical interconnect apparatus for removably engaging electrically conductive pads on semiconductor substrates having integrated circuitry fabricated therein, the apparatus comprising:

an apparatus substrate; and

an engagement probe projecting from the apparatus substrate to engage a single conductive pad on a semiconductor substrate having integrated circuitry formed in the semiconductor substrate, the engagement probe having an outer surface comprising an apex in the form of a knife-edge line and comprising semiconductor material and configured to removably penetrate a single conductive pad of the semiconductor substrate comprising integrated circuitry and to removably penetrate another single conductive pad of another semiconductor substrate also comprising integrated circuitry.

32. [Previously Presented] The removable electrical interconnect apparatus of claim 31 wherein the engagement probe is formed on a projection from the apparatus substrate.

33. [Original] The removable electrical interconnect apparatus of claim 31 wherein the knife-edge line projects from a penetration stop plane.

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34. [Previously Presented] The removable electrical interconnect apparatus of claim 31 wherein the knife-edge line projects from a penetration stop plane, the knife-edge line having a tip and having a base at the penetration stop plane, the tip being a distance from the penetration stop plane of about one-half the thickness of conductive pads which the apparatus is adapted to engage.

35. [Previously Presented] The removable electrical interconnect apparatus of claim 31 wherein the engagement probe is formed on a projection from the apparatus substrate, the knife-edge line projecting from a penetration stop plane on the projection.

36. [Previously Presented] The removable electrical interconnect apparatus of claim 31 wherein the engagement probe is formed on a projection from the apparatus substrate, the knife-edge line projects from a penetration stop plane on the projection, the knife-edge line having a tip and having a base at the penetration stop plane, the tip being a distance from the penetration stop plane of about one-half the thickness of conductive pads which the apparatus is adapted to engage.

37. [Previously Presented] The removable electrical interconnect apparatus of claim 31 wherein outermost portions of the apex comprise a first electrically conductive material, and wherein the conductive pads for which the apparatus is adapted to engage have outermost portions comprising a second electrically conductive material; the first and second electrically conductive materials being different.

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38. [Previously Presented] The removable electrical interconnect apparatus of claim 31 wherein the engagement probe comprises material of a bulk semiconductor substrate.

39. [Original] The removable electrical interconnect apparatus of claim 31 wherein the knife-edge line includes an outer conductive layer.

40. [Previously Presented] The removable electrical interconnect apparatus of claim 31 wherein the outer surface includes plural knife-edge lines configured to engage the single conductive pads.

41. [Previously Presented] The removable electrical interconnect apparatus of claim 31 wherein the engagement probe is formed from a semiconductor substrate and the outer surface includes plural knife-edge lines configured to engage the single conductive pads.

42. [Previously Presented] The removable electrical interconnect apparatus of claim 31 wherein the engagement probe is formed from a semiconductor substrate and the outer surface includes plural knife-edge lines configured to engage the single conductive pads and the knife-edge lines include outer conductive layers.

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Claims 43-53 are canceled.

54. [Currently Amended] A removable engagement probe having an outer surface comprising an apex in the form of a knife-edge line and comprising semiconductor material and sized and positioned to penetrate a single conductive pad; and wherein the knife-edge line projects from a penetration stop plane; and wherein the knife-edge line is formed on a projection from a substrate.

55. Cancel.

56. [Currently Amended] The removable engagement probe of claim 54 wherein the outer surface comprises a plurality of apexes having respective tips and bases, and the penetration stop plane is intermediate the bases and substantially parallel to a surface of [[a]] the substrate.

57. [Previously Presented] The removable engagement probe of claim 54 wherein the knife-edge line has a tip and has a base at the penetration stop plane, the tip being a distance from the penetration stop plane of about one-half the thickness of the conductive pad which the apparatus is adapted to engage.

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58. [Currently Amended] The removable engagement probe of claim 54 wherein the knife-edge line ~~is formed on a projection from a substrate and~~ projects from the penetration stop plane on the projection.

59. [Currently Amended] The removable engagement probe of claim 54 wherein the knife-edge line ~~is formed on a projection from a substrate and~~ projects from the penetration stop plane on the projection, the knife-edge line having a tip and having a base at the penetration stop plane, the tip being a distance from the penetration stop plane of about one-half the thickness of the conductive pad which the apparatus is adapted to engage.

60. [Previously Presented] The removable engagement probe of claim 54 wherein outermost portions of the apex comprise a first electrically conductive material, and wherein the conductive pad for which the probe is adapted to engage has outermost portions comprising a second electrically conductive material; the first and second electrically conductive materials being different.

61. [Previously Presented] The removable engagement probe of claim 54 wherein the probe comprises material of a bulk semiconductor substrate.

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62. [Previously Presented] The removable electrical interconnect apparatus of claim 31 wherein the knife-edge line is sized and positioned to extend elevationally above an uppermost surface of the apparatus substrate.

63. [Previously Presented] The removable electrical interconnect apparatus of claim 32 wherein the projection includes a surface substantially parallel to a surface of the apparatus substrate.

64. [Currently Amended] The removable engagement probe of claim 54 wherein the knife-edge line projects elevationally above an uppermost surface of ~~a substrate~~ the projection which defines the penetration stop plane.

65. [Currently Amended] The removable engagement probe of claim ~~[[55]]~~ 54 wherein the projection has a surface substantially parallel to a surface of ~~[[a]]~~ the substrate and ~~which~~ the surface of the projection defines the penetration stop plane.

66. Canceled.

67. [Previously Presented] The removable electrical interconnect apparatus of claim 31 wherein the apparatus substrate comprises semiconductor material.

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68. [Previously Presented] The removable electrical interconnect apparatus of claim 31 wherein the apparatus substrate comprises semiconductor material and the engagement probe comprises semiconductor material of the apparatus substrate.

69. [Previously Presented] The removable engagement probe of claim 54 wherein the engagement probe comprises semiconductor material.

70. [Previously Presented] The removable engagement probe of claim 54 wherein the engagement probe comprises semiconductor material formed from a semiconductor substrate.

Claims 71-74 are canceled.

75. [Previously Presented] The removable electrical interconnect apparatus of claim 31 wherein the apex comprises a solid mass of material devoid of any void space.

76. [Previously Presented] The removable engagement probe of claim 54 wherein the apex comprises a solid mass of material devoid of any void space.

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77. [Currently Amended] An electrical system comprising:

a first electrically conductive pad on a first semiconductor substrate comprising integrated circuitry formed using the first semiconductor substrate;

a second electrically conductive pad on a second semiconductor substrate comprising integrated circuitry formed using the second semiconductor substrate; and

a removable electrical interconnect apparatus ~~for removably engaging~~ configured to removably engage the first and second electrically conductive pads, the apparatus comprising:

an apparatus substrate; and

an engagement probe projecting from the apparatus substrate ~~to engage the first electrically conductive pad, the engagement probe having an outer surface and~~ comprising an apex in the form of a knife-edge line and ~~comprising~~ wherein the apex comprises semiconductor material ~~and~~ configured to removably engage the first electrically conductive pad and to removably engage the second electrically conductive pad.

78. [Previously Presented] The electrical system of claim 77 wherein the apex is configured to penetrate the first and the second electrically conductive pads.

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79. [Currently Amended] An electrical system comprising:
a single conductive pad;
a removable engagement probe ~~having an outer surface~~ comprising an apex in the form of a knife-edge line and comprising semiconductor material and sized and positioned to engage the single conductive pad; and
wherein the knife-edge line projects from a penetration stop plane.

80. [Previously Presented] The electrical system of claim 79 wherein the apex is configured to penetrate the single conductive pad.

81. [Previously Presented] The removable electrical interconnect apparatus of claim 31 wherein the apex in the form of the knife-edge line comprises a polyhedron.

82. [Previously Presented] The removable electrical interconnect apparatus of claim 31 wherein the apex in the form of the knife-edge line comprises a triangular prism.

83. [Previously Presented] The removable engagement probe of claim 54 wherein the apex in the form of the knife-edge line comprises a polyhedron.

84. [Previously Presented] The removable engagement probe of claim 54 wherein the apex in the form of the knife-edge line comprises a triangular prism.

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85. [Previously Presented] The electrical system of claim 77 wherein the apex in the form of the knife-edge line comprises a polyhedron.

86. [Previously Presented] The electrical system of claim 77 wherein the apex in the form of the knife-edge line comprises a triangular prism.

87. [Previously Presented] The electrical system of claim 79 wherein the apex in the form of the knife-edge line comprises a polyhedron.

88. [Previously Presented] The electrical system of claim 79 wherein the apex in the form of the knife-edge line comprises a triangular prism.

89. [New] A removable engagement probe having an outer surface comprising an apex in the form of a knife-edge line and comprising semiconductor material and sized and positioned to penetrate a single conductive pad;

wherein the knife-edge line projects from a penetration stop plane; and

wherein the outer surface comprises a plurality of apexes having respective tips and bases, and the penetration stop plane is intermediate the bases and substantially parallel to a surface of a substrate.

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90. [New] A removable engagement probe having an outer surface comprising an apex in the form of a knife-edge line and comprising semiconductor material and sized and positioned to penetrate a single conductive pad;

wherein the knife-edge line projects from a penetration stop plane; and

wherein the knife-edge line has a tip and has a base at the penetration stop plane, the tip being a distance from the penetration stop plane of about one-half the thickness of the conductive pad which the apparatus is adapted to engage.

91. [New] A removable engagement probe having an outer surface comprising an apex in the form of a knife-edge line and comprising semiconductor material and sized and positioned to penetrate a single conductive pad;

wherein the knife-edge line projects from a penetration stop plane; and

wherein outermost portions of the apex comprise a first electrically conductive material, and wherein the conductive pad for which the probe is adapted to engage has outermost portions comprising a second electrically conductive material, the first and second electrically conductive materials being different.